

REMARKS

Status of the Application

Claims 1-14 and 16-36 are pending and at issue in this application, with claims 1, 16, and 30 being independent claims. With this response, Applicants amend certain of the claims to correct typographical errors. The amendments do not add new matter or change the scope of any amended claim. In light of the following remarks, Applicants respectfully request reconsideration and favorable action in this case.

Amendment to the Specification

The specification was amended to add a "Government License Rights" statement.

Amendment to the Drawings

Figure 2 was amended to correct an error and to bring it into accord with the text of the specification. In particular, the text of the specification indicates that the block 44 should read "ALIGN OR POSITION SUBJECT," the text of block 46 should read "ADJUST FOCAL LENGTH," and the text of block 48 should read "RETINAL (FP) EXCITATION." See e.g., *Present Application* at pars. [0016], [0017], and [0018].

Claim Rejections Under 35 U.S.C. § 103

The Office action rejects claims 1-14 and 16-36 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,569,354 to Shapiro et al. (hereinafter "Shapiro") in view of U.S. Patent No. 6,478,424 to Grinvald et al (hereinafter "Grinvald"). Applicants respectfully traverse the rejection.

The Office action failed to establish that Claim 1 is unpatentable over Shapiro in view of Grinvald at least because Shapiro and Grinvald, alone or in combination, fail to disclose or suggest all of the limitations of claim 1 and, in particular, fail to disclose or suggest both of "an excitation light source adapted to provide an excitation light that maximizes the excitation of flavoprotein auto-fluorescence and minimizes the excitation of non-flavoprotein auto-fluorescence" and "a filter adapted to maximize the passage of

flavoprotein auto-fluorescence and attenuate non-flavoprotein auto-fluorescence in the retina fluorescence signal” as claim 1 recites.

The Office action cites Shapiro as allegedly teaching “the use of an excitation light source such as a mercury lamp or laser to provide an excitation light at a wavelength corresponding to excitation of flavoprotein autofluorescence.” (See Office action, page 2.) However, Applicants submit that providing an excitation light at a wavelength corresponding to excitation of flavoprotein auto-fluorescence is not the same as providing an excitation light that maximizes the excitation of flavoprotein auto-fluorescence and *minimizes the excitation of non-flavoprotein auto-fluorescence*, as claim 1 recites. While Shapiro describes a light source that emits light that is “well within the range of frequencies which will excite the flavoproteins,” and that “light at about that frequency is passed through the filter” (Shapiro, col. 4, lines 43-48), Shapiro does not disclose or suggest a filter (or any other mechanism) for minimizing the excitation of non-flavoprotein auto-fluorescence. Thus, at least because Shapiro and Grinvald fail to disclose or suggest this limitation of claim 1, they cannot render claim 1 obvious.

The Office action also cites Shapiro as allegedly teaching a filter that “reduces background wavelengths from the retina fluorescence signal.” (See Office action, page 2.) But Shapiro merely describes a filter that “passes the green fluorescent light of about 520 nm, but blocks the blue excitation light.” (Shapiro, col. 5, lines 27-29; see also, col. 4, lines 13-15.) Shapiro does not disclose or suggest “a filter adapted to maximize the passage of flavoprotein auto-fluorescence and attenuate non-flavoprotein auto-fluorescence in the retina fluorescence signal” as claim 1 recites. Merely blocking excitation light is not the same as “attenuate[ing] non-flavoprotein auto-fluorescence in the retina fluorescence signal” as claim 1 recites. Thus, at least because Shapiro and Grinvald also fail to disclose or suggest this limitation of claim 1, they cannot render claim 1 obvious.

Moreover, as the Office action acknowledges, Shapiro does not disclose or suggest an image capture device adapted to record a single image of the retinal fluorescence signal. (See Office action, page 3.) The Office action asserts that it would have been obvious to modify the apparatus of Shapiro to utilize a technique described in Grinvald, and that such

a combination would render the claims obvious. Applicants respectfully traverse this assertion.

Grinvald describes a technique in which two images of an eye are captured: a first or baseline image, in which the eye is “at rest” (i.e., the eye has not been stimulated by visible light), and a second image taken during stimulation or after stimulation of the eye with visible light. The baseline image measures reflectance or fluorescence of the eye at rest, and the second image measures reflectance or fluorescence of the eye after or during stimulation by visible light. (See Grinvald at col. 3, lines 12-26, 53-56; col. 4, lines 56-61.) Grinvald teaches that stimulation with visible light causes changes in the reflectance/fluorescence of the retina, and these changes can be measured by comparing the first and second images. (See e.g., Grinvald, col. 1, lines 47-49; the changes are “directly related to local retinal responsiveness to visible light.”) For example, Grinvald teaches using visible light to stimulate the eye, and measuring reflectance of the retina at infrared, 750 nm, (i.e., non-visible light) before and after stimulation. The technique described in Grinvald cannot work if applied to Shapiro.

In Shapiro, fluorescence of flavoprotein is caused by applying excitation light that is in the visible spectrum (i.e., Shapiro describes an excitation light that includes the frequency 450 nm.). Thus, with the Shapiro apparatus, flavoprotein autofluorescence cannot be measured without stimulating the eye with visible light. Accordingly, the technique described in Grinvald cannot be used with the apparatus of Shapiro because it would not be possible to obtain a baseline image (i.e., an image prior to the eye being stimulated with visible light).

Because the alleged modification of Shapiro would not work and/or provide the benefits alleged in the Office Action and taught in Grinvald, one of ordinary skill in the art would not find it obvious to make such a modification. Accordingly, the Office Action failed to establish a prima facie case of obviousness at least for this additional reason.

For at least reasons similar to those discussed above with respect to claim 1, Shapiro and Grinvald, alone or in combination, fail to render independent claims 16 and 30 obvious.

Claims 2-14, 17-29, and 31-36 depend from claims 1, 16, and 30, respectively.

For at least the same reasons as claims 1, 16, and 30, Shapiro and Grinvald, alone or in combination, fail to render independent claims 2-14, 17-29, and 31-36 obvious.

Conclusion

Applicants submit that the claims are in condition for allowance for the reasons provided above. Although Applicants believe that no other fees or petitions are due, the Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 13-2855 of Marshall, Gerstein & Borun, LLP under Order No. 30275/39376.

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Respectfully submitted,

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